

| Design Element | | | Manual Section | 2-Lane | | | | Multi-Lane | | |
|--|---|--------------------------------------|--------------------|--|----------------------|----------------------|----------------------|--|--|--|
| Design Controls | Design Year Traffic (AADT) | | 40-2.01 | < 400 | 400 ≤ AADT < 3000 | 3000 ≤ AADT < 5000 | ≥ 5000 | Undivided | Divided | |
| | Design Forecast Year | | 55-4.01 | 20 Years (1) | | | | 20 Years (1) | | |
| | *Design Speed (km/h) (2) | | 55-4.01 | Posted Speed Limit | | | | Posted Speed Limit | | |
| | Access Control | | 40-5.0 | Partial Control / None | | | | Partial Control / None | | |
| | Level of Service | | 40-2.0 | Desirable: B; Minimum: D | | | | Desirable: B; Minimum: D | | |
| Cross Section Elements | Travel Lane | *Width | 55-4.05 | 3.6 m | 3.6 m | 3.6 m | 3.6 m | 3.6 m | | |
| | | Typical Surface Type (3) | Ch. 52 | Asphalt / Concrete | | | | Asphalt / Concrete | | |
| | Shoulder (4) | Width Usable | 55-4.05 | D: 1.8 m M: 0.6 m | D: 2.4 m M: 0.9 m | D: 2.4 m M: 1.8 m | D: 3.3 m M: 2.4 m | Desirable: 3.3 m Minimum: 2.4 m | Rt: D: 3.3 m; M: 2.7 m Lt: D: 1.2 m; M: 1.2 m | |
| | | *Width Paved | 55-4.05 | D: 1.2 m M: 0.0 m | D: 1.8 m M: 0.6 m | D: 1.8 m M: 0.6 m | D: 3.0 m M: 0.6 m | Desirable: 3.0 m Minimum: 2.4 m | Rt: D: 3.0 m; M: 2.4 m Lt: D: 1.2 m; M: 0.9 m | |
| | | Typical Surface Type (3) | Ch. 52 | Asphalt / Concrete / Sealed Aggregate | | | | Asphalt / Concrete / Sealed Aggregate | | |
| | Cross Slopes | *Travel Lane (5) | 55-4.05 | 2% | | | | 2% | | |
| | | Shoulder (6) | 55-4.05 | 4% Asphalt / Concrete; 6% Sealed Aggregate | | | | 4% Asphalt / Concrete; 6% Sealed Aggregate | | |
| | Auxillary Lanes | Lane Width | 55-4.05 | Desirable: 3.6 m; Minimum: 3.3 m | | | | Desirable: 3.6 m; Minimum: 3.3 m | | |
| | | Shoulder Width | | Des: Same as Next to Travel Lane; Min: 0.6 m | | | | Des: Same as Next to Travel Lane; Min: 0.6 m | | |
| | Median Width | | 55-4.05 | N/A | | | | 0.0 m | Existing | |
| | Obstruction Free Zone | | 55-5.02 | See Section 55-5.02 | | | | See Section 55-5.02 | | |
| | Side Slopes | Cut | Foreslope | 55-4.05 | 2:1 or Flatter (7) | | | | 2:1 or Flatter (7) | |
| | | | Ditch Width | | (7) | | | | (7) | |
| | | | Backslope | | 2:1 or Flatter (7) | | | | 2:1 or Flatter (7) | |
| | | Fill | 2:1 or Flatter (7) | | | | 2:1 or Flatter (7) | | | |
| | Median Slopes | | 55-4.05 | N/A | | | | Desirable: 8:1; Maximum: 4:1 | | |
| Bridges** | New and Reconstructed Bridges | *Structural Capacity | Ch. 60 | HS-20 (8) | | | | | | |
| | | *Clear Roadway Width (9) | 55-6.03 | Full Paved Approach Width | | | | | | |
| | Existing Bridges to Remain in Place | *Structural Capacity | Ch. 60 | HS-20 | | | | | | |
| | | *Clear Roadway Width | 55-6.02 | Travelway Plus 0.6 m on Each Side | | | | | | |
| | *Vertical Clearance (Arterial Under) (10) | New and Replaced Overpassing Bridges | 55-6.0 | 5.05 m | | | | | | |
| | | Existing Overpassing Bridges (11) | | 4.30 m | | | | | | |
| | | Sign Truss / Pedestrian Bridges | | New: 5.35 m; Existing: 5.20 m | | | | | | |
| Vertical Clearance (Arterial Over Railroad) (12) | | Ch. 69 | 7.00 m | | | | | | | |

D or Des: Desirable; M or Min: Minimum.

* Controlling design criteria (see Section 40-8.0). ** Selection of the cross section and bridge elements is based on the design year traffic volumes irrespective of the design speed.

**GEOMETRIC DESIGN CRITERIA FOR RURAL ARTERIALS
(3R Projects)**

Table 55-3A

| Design Element | | | Manual Section | | | |
|--------------------|--|---------------------------------|-------------------------------|---------------------|---------------------|---------------------|
| Alignment Elements | Design Speed | | | 80 km/h | 90 km/h | 100 km/h |
| | *Stopping Sight Distance | | 55-4.02 | 130 m | 160 m | 185 m |
| | DecisionSight Distance | Speed / Path / Direction Change | 42-2.0 | 230 m | 270 m | 315 m |
| | | Stop Maneuver | | 140 m | 170 m | 200 m |
| | Passing Sight Distance | | 42-3.0 | Existing | Existing | Existing |
| | Intersection Sight Distance, -3% to +3% (14) | | 55-4.06 | P: 190 m; SU: 235 m | P: 230 m; SU: 280 m | P: 265 m; SU: 320 m |
| | *Minimum Radii | | 55-4.03 | See Section 55-4.03 | | |
| | *Superelevation Rate | | 55-4.03 | See Section 55-4.03 | | |
| | *Horizontal Sight Distance | | 55-4.03 | See Section 55-4.03 | | |
| | *Vertical Curvature (K-values) | Crest | 55-4.04 | See Section 55-4.04 | | |
| | | Sag | | See Section 55-4.04 | | |
| | *Maximum Grade (13) | Level | 55-4.04 | 5% | 4.5% | 4% |
| | | Rolling | | 6% | 5.5% | 5% |
| Minimum Grade | | 44-1.03 | Desirable: 0.5%; Minimum 0.0% | | | |

* Controlling design criteria (see Section 40-8.0)

These standards are for use on Rural Arterials including those on the National Highway System. They are to be used for all projects that are classified as 3R regardless of funding sources. Therefore, all 3R work, whether Federal-aid funded or not, must meet these standards. Deviations from controlling design criteria should be covered by an approved design exception. Also, any operational or maintenance changes, permanent or temporary, exclusive of work zone traffic control that in fact create substandard conditions such as by re-striping to obtain added lane(s) by reducing existing land widths and/or shoulders, must be covered by design exceptions whether or not actual construction or reconstruction is involved.

Design exception requests for Level One design criteria on:

- Non-Exempt FHWA Projects on the Interstate system require FHWA Approval.
- Exempt FHWA Funded Projects on the Interstate system require Chief, Division of Design approval.
- Non-FHWA Federally Funded Projects on the Interstate system require Chief, Division of Design approval with an informational copy sent to FHWA.
- Projects not on the Interstate system require Chief, Division of Design approval.

GEOMETRIC DESIGN CRITERIA FOR RURAL ARTERIALS (3R Projects)

Table 55-3A (Continued)

GEOMETRIC DESIGN CRITERIA FOR RURAL ARTERIALS

(3R Projects)

Footnotes to Table 55-3A

- (1) Design Forecast Year. For resurfacing projects, the pavement should be designed for at least a 10-year design life.
- (2) Design Speed. The minimum design speed should equal a) the anticipated posted speed limit after construction or b) the state legal limit (90 km/h) on non-posted highways.
- (3) Surface Type. The pavement type selection will be determined by the INDOT Pavement Design Engineer or by the local jurisdiction.
- (4) Shoulder. The following will apply:
 - a. On INDOT facilities, the shoulder is paved to the front face of guardrail. The desirable guardrail offset is 0.6 m from the effective usable shoulder width. In restrictive situations, the guardrail offset may be 0.3 m from the effective usable shoulder width. See Section 49-5.0 for more information.
 - b. If guardrail is present, the minimum offset from E.T.L. to the front face of guardrail should desirably be equal to the shy line distance, but not less than 1.2 m. See Section 49-5.0 for shy line offsets.
 - c. Usable shoulder width is defined as the distance from the edge of the travel lane to the shoulder break point.
- (5) Cross Slope (Travel Lane). Cross slopes of 1.5% are acceptable on existing bridges to remain in place.
- (6) Cross Slopes (Shoulder). Table values are for tangent sections; see Section 43-3.06 for shoulder cross slopes on horizontal curves.
- (7) Side Slopes. Section 55-4.05 provides additional information for side slope criteria.
- (8) Structural Capacity (New and Reconstructed Bridges). The following will apply:
 - a. All bridges on facilities with greater than 600 trucks per day should be checked using the Alternate Military Loading.
 - b. All State highway bridges within 25 km of a Toll Road Gate must be designed for Toll Road Loading.
 - c. All bridges on "Extra Heavy Duty Highways" must be designed for the Michigan Train truck loading configuration.
 - d. See Chapter Sixty for additional information on the loading criteria.
- (9) Width (New and Reconstructed Bridges). Widths are minimums for 3R projects. See Section 59-1.0 for additional information on bridge widths. On State highways, the minimum clear roadway width should be 9.4 m.
- (10) Vertical Clearance (Arterial Under). Table values include an additional 150-mm allowance for future pavement overlays. Vertical clearances apply from usable edge to usable edge of shoulders.

- (11) Vertical Clearance (Existing Bridges). See Section 55-6.02 for additional information on minimum allowable vertical clearances.
- (12) Vertical Clearance (Arterial Over Railroad). See Chapter Sixty-nine for additional information on railroad clearances under highways.
- (13) Maximum Grades. Grades 1% steeper may be used for one-way downgrades.
- (14) Intersection Sight Distance. For left turn onto a 2-lane road. P = Passenger car; SU = single unit truck. See Figure 46-10G for values for combination trucks.